

# IBM System x3850 X5 and x3950 X5 servers provide high-performance, scalable, and flexible Intel Xeon processor-based systems

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## At a glance



New models summary:

- One x3850 X5 model with the Intel Xeon™ E7-8870 processor provides an easier way to order systems that have the highest performance processor, which also can be scaled to two nodes and eight processors without using MAX5 options and eXA scaling cables.
- One x3950 X5 model with MAX5 and a Red Hat Enterprise Linux™ software registration card provides a Red Hat Kernel-Based Virtual Machine (KVM) virtualization-ready system with maximum memory for more and larger virtual machines or guests.

IBM® System x3850 X5 and x3950 X5 servers incorporate high-performance, 6-core, 8-core, and 10-core Intel Xeon processors and:

- Up to 64 DIMM slots per system (96 with MAX5), delivering up to 3 TB (with MAX5 and 32 GB DIMMs) of high-speed, lower-power, PC3-10600 ECC double data rate 3 (DDR3) SDRAM system memory
- Up to 192 DIMM slots per dual node system with MAX5 and eXA scaling, delivering up to 6 TB (with 32 GB DIMMs) of high-speed, lower-power, PC3-10600 ECC double data rate 3 (DDR3) SDRAM system memory
- eXFlash for high-performance solid-state drive storage
- eXA scaling with dual node systems with MAX5 for performance scaling up to eight sockets with FlexNode partitioning and node failover
- Emulex 10 Gb Ethernet Integrated Virtual Fabric Adapter
- Seven 5.0 Gb PCIe I/O (one x16, five x8, one x4) sockets

- Serial Attached SCSI (SAS) controller
- Integrated Broadcom 5709 Dual-port 10/100/1000 Megabit Ethernet
- Up to eight 2.5-inch hot-swap bays for flexible installation of HDDs
- Up to sixteen 1.8-inch hot-swap SSDs with total 3.2 TB of internal storage
- Standard Integrated Management Module
- Up to two 1975-watt, voltage sensing, rear access, hot-swap power supplies in main x3950 X5 chassis, with additional two 675-watt, voltage sensing, rear access, hot-swap power supplies in the MAX5 expansion
- Optional UltraSlim Enhanced SATA CD-RW/DVD-ROM Combo drive
- Six USB ports (two can be used for USB keyboard and mouse), SVGA video port, one serial port, and two 1 Gb Ethernet ports per chassis

**Warranty:** Three years, customer replaceable unit (CRU) and on-site<sup>1</sup> service, limited warranty<sup>2</sup>; optional warranty service upgrades available.

## Overview

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These models of the System x3850 X5 and x3950 X5 servers are powered with 6-core, 8-core, and 10-core Intel Xeon processors, with optional IBM MAX5 memory expansion and eXFlash storage for powerful 4-socket, highly scalable systems.

IBM MAX5 for System x® is a scalable, 1U, memory expansion drawer. It delivers 32 additional DIMM slots to the x3850 X5 and x3950 X5. It has a memory controller for added performance and a node controller for x3850 scalability to two nodes with eight sockets, 192 DIMM slots, and eXA scaling. MAX5 is available as an option for most x3850 X5 and x3950 X5 models.

These new models provide preconfigured servers with MAX5, Red Hat software and the Intel Xeon E7-8870 processor.

The new IBM System x3950 X5 model with Red Hat software is a Workload Optimized Solution for Open Virtualization, which includes Red Hat Enterprise Linux with the Red Hat Enterprise Virtualization Hypervisor (Kernel-Based Virtual Machine (KVM)).

The x3850 X5 and x3950 X5 servers are the fifth generation of the Enterprise X-Architecture® (eX5), delivering innovation with enhanced reliability and availability features to enable optimal performance for databases, enterprise applications, and virtualized environments.

Potential benefits include:

- Increased performance
- Greater system uptime with advanced memory RAS
- Larger virtual machines with more virtual machines per system and increased CPU utilization with MAX5
- Four sockets for up to four processors and 64 DIMMs (96 DIMMs with MAX5) for larger databases, enterprise applications, and mission-critical workloads
- Advanced networking capabilities with Emulex 10 Gb Virtual Fabric Adapter, standard in most models
- Low-power cost-effective memory with Advanced Buffer eXecution chip
- Integrated Management Module (IMM) for enhanced systems management capabilities
- Power management savings
- Up to 10-core processing performance per socket
- Memory ProteXion with Chipkill, memory mirroring, memory sparing, Intel™ SMI lane failover, SMI packet retry, and SMI clock failover
- Up to 96 DIMM slots per system with MAX5 delivering up to 3 TB (with 32 GB DIMMs) of high-speed PC3-10600 DDR3 memory

- Up to 192 DIMM slots per dual node system with MAX5 and eXA scaling, delivering up to 6 TB (with 32 GB DIMMs) of memory
- Serial Attach SCSI (SAS) plus RAID to maximize throughput and simplify installation and data protection
- Up to eight 2.5-inch SATA or SAS HDDs, or sixteen 1.8-inch SSDs with eXFlash, or a combination of both; most models come standard with one HDD backplane that can hold four drives, the second backplane is optional.
- 4U server plus 1U MAX5 rack-optimized, tool-free chassis that strikes the balance between rack density and ease of maintenance
- Rear access power supplies for easy access

*Fifth-generation eX5 technology features*

- New, leadership memory expansion and performance scaling technology, above and beyond industry standard
- eXFlash for high-performance solid-state drive storage
- eXA scaling with dual node systems with MAX5 for performance scaling up to eight sockets with FlexNode partitioning and node failover
- Advanced fifth-generation Chipkill ECC memory controller to help correct single-bit, 2-bit, 3-bit, and 4-bit memory errors
- High-performance PCIe Gen 2 (5 GHz) I/O slots
- Hot-swap drive bays and redundant fans to replace select components without powering down the server
- One or two hot-swap, rear access, redundant power supplies with 220 V ac input in each system (up to two 1975 W in the x3850 X5, two in the x3950 X5, and two 675 W in the MAX5)
- Predictive Failure Analysis (PFA) on processors, memory, fans, power supply, and HDD options to help warn of problems before they occur
- Innovative light path diagnostics and top access design; easy to service and configure

<sup>1</sup> IBM sends a technician after attempting to diagnose and resolve the problem remotely.

<sup>2</sup> For information on the IBM Statement of Limited Warranty, visit

[http://www.ibm.com/servers/support/machine\\_warranties/](http://www.ibm.com/servers/support/machine_warranties/)

Alternatively, this information is also available by contacting your IBM representative or reseller. Copies are available upon request.

**Feature exchange**

None

**Key prerequisites**

Refer to the [Hardware requirements](#) section for details.

**Planned availability date**

October 31, 2011

## Description

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### **IBM System x3850 X5 and x3950 X5 servers**

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#### ***High-performance server subsystems***

The new x3850 X5 and x3950 X5 servers are high-throughput, scalable, SMP-capable, 6-core, 8-core, and 10-core Intel Xeon-based servers. They deliver excellent scalability for adding memory, adapter cards, or multiple processors.

Models are powered with 6-core, 8-core, and 10-core Intel Xeon processors that use 64-byte cache lines. EMT64T architecture supports 64-bit extensions. Four connectors for Xeon MP processors are standard on the system board. High-speed PC3-10600 ECC SDRAM provides excellent processor-to-memory subsystem performance.

The x3850 X5 and x3950 X5 system architecture is fine tuned and engineered to optimize the powerful Xeon processors. This architecture consists of the following components:

- 6-core, 8-core, and 10-core Xeon processors
- System memory cards with Intel Scalable Memory Buffers
- Intel host-bridge I/O controllers

These Xeon processors use Intel Quick Path Interconnect buses for external operations. Each processor supports four independent buses to the memory, for a total of 34 GB/s of potential memory bandwidth per CPU.

#### ***High-availability and serviceability features***

Many enterprise on-demand environments run around the clock to supply information around the world. These environments require ruggedly dependable servers designed with features that can tolerate a component failure without total shutdown. The x3850 X5 and x3950 X5 servers pack numerous fault-tolerant and high-availability features into a high-density, rack-optimized package that helps significantly reduce the space needed to support massive network computing operations.

Features include:

- Seven 5.0 Gb PCIe I/O (one x16, five x8, one x4) sockets
- Eight Serial Attach SCSI (SAS) HDD bays
- ECC DIMMs combined with an integrated advanced ECC memory controller with fourth-generation Chipkill support to correct many single-bit, 2-bit, 3-bit, and 4-bit memory errors to minimize disruption of service to LAN clients
- Memory ProteXion and memory mirroring
- Memory hardware scrubbing to correct many soft memory errors automatically without software intervention down time

- PFA on HDD options, memory, processors, power supply, and fans, in conjunction with IBM Systems Director, to help alert the system administrator of an imminent component failure
- Up to two 1975-watt, voltage sensing, rear access, hot-swap power supplies in the main x3850 X5 and x3950 X5 chassis, with two additional 675-watt, voltage sensing, rear access, hot-swap power supplies in the MAX5 expansion that enable individual fan replacement without powering down the server, plus one fan in each of the two hot-swap power supplies
- Standard IMM enabling diagnostic, reset, POST, and auto-recovery functions from remote locations and monitoring of temperature, voltage, and fan speed; alerts generated when thresholds are exceeded without utilizing an I/O slot
- Information LED panel, diagnostics LED panel, and component LEDs for visual indications of system well-being
- Light path diagnostics for an outside view of the potential problem without removing the cover, to help reduce down time and service costs
- Easy top access to system board, adapter cards, and memory
- CPU failure recovery in SMP configurations, allowing a failed processor to be forced offline, the server rebooted, an alert generated, and operation continued with the working processor
- Automatic node failover for increased availability in dual-node configurations

The servers include:

- Up to 8-socket (80-core) SMP operations with powerful 6-core, 8-core, and 10-core Xeon processors
- Up to 64 DIMM slots in 4U of rack space (96 DIMM slots per combined x3850 + MAX5 in 5U of rack space delivering up to 3 TB (with 32 GB DIMMs) of high-speed PC3-10600 DDR3 memory)
- Up to eight sockets and 192 DIMM slots with two x3850 + MAX5 systems
- Two worldwide, voltage-sensing, 1975-watt, hot-swap power supplies with auto-restart, standard
- Eight hot-swap drive bays, supporting up to 4 TB of internal data storage (using eight 500 GB SATA hot-swap HDDs)
- With eXFLash, up to 16 hot-swap drive bays, supporting up to 3.2 TB of internal data storage (using sixteen 200 GB hot-swap SSDs)
- Terabytes of external data storage supporting optional storage units, ServeRAID SCSI controllers, and Fibre Channel controllers and storage units

## **Configurations**

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### **XpandOnDemand scalability**

- Modular building-block scalability delivers the flexibility to scale to meet your business needs, and to configure your system to optimize your application and business needs.

### **IBM MAX5 for System x**

IBM MAX5 for System x is a scalable, 1U, memory expansion drawer. It delivers an additional 32 DIMM slots to the x3850 X5 and x3950 X5 with a memory controller for added performance and a node controller for x3850 scalability.

Main features include:

- Intel QPI link topology at up to 6.4 Gbps with four QPI links for host connection
- Intel ISMI link topology at up to 6.4 Gbps with eight ISMI links
- Sixteen DDR3 buses with support for up to 32 DIMMs per MAX5

The processors in the host systems have the following two QPI link speeds, which derive the various bus speeds throughout the system, both in the host and the IBM MAX5 for System x drawer. Refer to the following table.

## IBM MAX5 for System x Bus Speeds Relationship

| Processor QPI Speed | Scalability Speed | ISMI Speed | DDR3 Speed |
|---------------------|-------------------|------------|------------|
| 5.86 GHz            | 9.6 GHz           | 5.86 GHz   | 977 MHz    |
| 6.4 GHz             | 10 GHz            | 6.4 GHz    | 1067 MHz   |

## IBM MAX5 for System x base electronics

- eX5 node and memory controller
  - Four 6.4 Gbps QPI 1.0 Links, for four CPUs
  - Three 10 Gbps EXA5 Scalability Links
  - Eight 6.4 Gbps ISMI buses (to eight memory buffers)
- Intel memory buffer
  - Two DDR3 memory buses per memory buffer
  - Two DIMMs per bus (up to Quad Rank DIMMs)
  - Thirty-two DIMM slots total
  - 2 GB, 4 GB, 8 GB, 16 GB, 32 GB DIMMs
  - DDR3 bus speed up to 1067 MHz
- No CPUs
- No IO slots
- No hard drives
- Systems management
  - Host system provides iBMC control
  - Light path LEDs
- Power and packaging
  - 1U scalable rack model
  - Two 675 W power supplies
  - Five redundant hot swap fans
  - Light path diagnostic display
- Operating systems
  - Solely dependent on attached host

The MAX5 drawer is designed to work seamlessly with the server and operating system software and provides a high-speed low-latency path to additional memory. The connection, enabled by the IBM-exclusive eX5 technology, is fast and wide enough to ensure that operating systems and applications see just a single, large memory space - thus no software modifications are necessary to use MAX5.

**IBM Systems Director CD** with 20 agent license proofs of entitlement includes support for the IBM System x3850 X5 and x3950 X5 servers.

### ***Systems management***

x3850 X5 and x3950 X5 servers feature IBM Systems Director, a powerful, highly integrated, systems-management software solution built on industry standards and designed for ease of use.

With IBM Systems Director, a network administrator can perform the following tasks:

- View the hardware configuration of remote systems in detail
- Monitor the usage and performance of critical components such as microprocessors, disks, and memory
- Centrally manage individual or large groups of IBM and non-IBM, Intel-based servers, desktop computers, workstations, and mobile computers on a variety of platforms

IBM Systems Director provides a comprehensive entry-level workgroup hardware manager. It has the following key features:

- Advanced self-management capabilities for maximum system availability.
- Support for multiple operating systems, including certain versions of Microsoft<sup>TM</sup> Windows<sup>TM</sup> 2003 Server, Windows XP Professional, Red Hat Linux, SUSE Linux, and Novell NetWare. For a complete list of operating systems that support IBM Systems Director, visit

[http://publib.boulder.ibm.com/infocenter/eserver/v1r2/index.jsp?topic=/diricinfo\\_5.20/fqm0\\_r\\_supported\\_operating\\_systems.html](http://publib.boulder.ibm.com/infocenter/eserver/v1r2/index.jsp?topic=/diricinfo_5.20/fqm0_r_supported_operating_systems.html)

The list is updated periodically.

- Support for IBM and non-IBM servers, desktop computers, workstations, and mobile computers. (Not all IBM Systems Director features are supported on non-IBM servers.)
- Support for systems-management industry standards.
- Integration into leading workgroup and enterprise systems-management environments.
- Ease of use, training, and setup.

IBM Systems Director also provides an extensible platform that supports advanced servers that are designed to help reduce the total cost of managing and supporting networked systems. By deploying IBM Systems Director, you may achieve reductions in ownership costs through the following potential benefits:

- Reduced down time
- Increased productivity of IT personnel and users
- Reduced service and support costs

For more information about IBM Systems Director, refer to the CD included with the server or the IBM Systems Director documentation on the CD, or visit

<http://www.ibm.com/systems/management/director/resources/>

IBM Systems Director includes IBM Systems Director Extensions, a portfolio of server tools that integrates into the IBM Systems Director interface and works with the Integrated Management Module, or other systems-management monitoring functions contained in IBM System x eX5 servers. Typical functions and monitoring capabilities can include:

- PFA-enabled critical hardware components
- Temperature
- Voltage
- Fan speed
- Light path diagnostics

The IT administrator gains comprehensive, virtual on-site control of IBM System x3850 and x3950 X5 servers through the ability to remotely:

- Access the server, in many cases regardless of its status
- Inventory and display detailed system and component information
- View server bootup during POST
- Browse and delete logs of events and errors
- Reset or power cycle the server
- Run diagnostics, SCSI, and RAID setup during POST
- Monitor thresholds on server health including:
  - Operating system load

- POST time-out
- Voltage
- Temperature
- Set proactive alerts for critical server events including PFA on:
  - Processors
  - Memory
  - Fans
  - Power supplies
  - HDDs
- Define automated actions such as:
  - Send an email or page to an administrator
  - Run a command or program
  - Send an error message to the IBM Systems Director console
- Flash BIOS
- Monitor and graph the utilization of server resources such as:
  - Memory
  - Processor
  - HDDs
- Identify potential performance bottlenecks and react to prevent down time

### ***Active Energy Manager tools and programs***

The IBM Active Energy Manager tool is available on the System x3850 X5 and x3950 X5 servers. IBM Systems Director Active Energy Manager™ V3.1 is the next-generation product of IBM PowerExecutive™ which was previously available from IBM for x86 systems only. IBM Systems Director Active Energy Manager now supports multiple IBM platforms and provides new capabilities that build upon the functions previously available with IBM PowerExecutive V2.1. Enhancements to existing function include:

- Cross-system monitoring and management support
- Dynamic polling rate
- Discovery and monitoring of intelligent PDUs

The Active Energy Manager V3.1 offering has both no-charge (free) monitoring functions and optional chargeable (fee-based) management functions.

### **No-charge monitor functions**

- Power Trending
- Thermal Trending
- iPDU Support

### **Priced Management functions**

- Power Capping
- Power Savings Mode

For more information, refer to

<http://www-03.ibm.com/systems/management/director/extensions/actengmrg.html>

Memory ProteXion

- Is included at no additional cost, requires no additional hardware, and works independently of the operating system

- Is similar to the "hot-spare" of a DASD array

Memory mirroring:

- Propels Intel-based servers towards continuous operations
- Dramatically helps to increase up time and allow scheduled maintenance
- Helps provide capability and reliability approaching a mainframe
- Is operating system independent; does not require drivers or operating system support

Chipkill memory:

- Offers integrated XA-64e chipsets for using off-the-shelf DIMMs
- Provides better memory reliability to support in-memory databases
- Increases availability by detecting and helping to correct single-bit, 2-bit, 3-bit, and 4-bit memory errors

### ***World-class support tools and programs***

x3850 X5 and x3950 X5 servers include tools and programs designed to make ownership a positive experience. From the start, IBM programs help you purchase servers, get them running, and keep them running. IBM can help your company maintain ownership of technology leadership network servers.

- IBM customer replaceable unit (CRU) and on-site, three-year limited warranty with next-business-day service (same-business-day service optionally available) protects your investment if a problem occurs. This service also includes replacement of parts identified through PFA.
- The ServerProven<sup>3</sup> program lets you confidently configure your server with various devices and operating systems. This web-based program provides compatibility information from actual testing of the x3850 X5 and x3950 X5 servers with various adapters and devices.
- The ServerGuide<sup>4</sup>CD library includes online publications and utilities and drivers that help you load popular network operating systems.
- Electronic support on the web offers additional support in an easy-to-use format.

<sup>3</sup> IBM makes no warranties, expressed or implied, regarding non-IBM products and services that are ServerProven, including but not implied warranties and of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

<sup>4</sup> The Microsoft Windows Preinstallation Environment software, included as part of ServerGuide software, may be used for boot diagnostic, setup, restoration, installation, configuration, test, or disaster recovery purposes only.

**Note:** To download the ServerGuide, visit

<http://www-03.ibm.com/systems/management/serverguide/sub.html>

The Microsoft Windows Preinstallation Environment software contains a security feature that will cause an end-user customer's system to reboot without prior notification to the end user customer after 24 hours of continuous use of the Microsoft Windows Preinstallation Environment. During routine usage of ServerGuide, which does not usually require usage of the Microsoft Windows Preinstallation Environment software for such an extended time period, this condition should not occur.

### ***IBM ToolsCenter***

The IBM ToolsCenter is a collection of server management tools to help manage your IBM System x and BladeServer environment. ToolsCenter makes managing your server environment less complicated, more productive and cost-effective.

For more information, refer to

## **Workload optimized solution for open Virtualization with Red Hat**

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- The IBM System x3950 X5 Workload Optimized Solution for Open Virtualization model offers an optimized configuration using open virtualization technologies from Red Hat. This model includes a three year subscription registration card for Red Hat Enterprise Linux, including the Red Hat Enterprise Virtualization Hypervisor (KVM). This subscription allows an unlimited number of guests running Red Hat Enterprise Linux. This subscription also includes Standard Red Hat Support. For more information on Standard Red Hat Support and Red Hat Enterprise Linux, refer to

<http://www.redhat.com>

### ***Additional Red Hat offerings***

In addition to Red Hat Enterprise Linux, you can optionally choose advanced add-on features and Red Hat Enterprise Virtualization Manager for Servers (RHEV-M).

#### **RHEV-M Server**

A feature-rich server virtualization management system that provides advanced capabilities for hosts and guests, including high availability, live migration, storage management, system scheduler. Red Hat Enterprise Virtualization helps your organization meet the challenges of virtualization:

- Performance and scalability: Providing near and better-than-bare metal performance and industry-leading scalability for enterprise workloads.
- Security: Leveraging SELinux and the hardened Red Hat Enterprise Linux kernel to provide a secure virtualization infrastructure.
- Ecosystem: Supporting the leading enterprise hardware, operating systems, and applications certified for Red Hat Enterprise Linux.
- Cost: Bringing unbeatable value in enterprise virtualization - by subscription.

Red Hat Enterprise Virtualization is an open platform on which to build an internal or private cloud of Red Hat Enterprise Linux or Windows virtual machines. RHEV-M Server consists of the following components:

- Red Hat Enterprise Virtualization Manager: A feature-rich server virtualization management system that provides advanced capabilities for hosts and guests, including high availability, live migration, storage management, and system scheduler.
- Red Hat Enterprise Virtualization Hypervisor: A modern hypervisor based on Kernel-Based Virtual Machine (KVM) virtualization technology which is deployed as the standalone bare metal hypervisor.

**Note:** Red Hat Enterprise Virtualization Hypervisor is also included in Red Hat Enterprise Linux (release 5.4, or later).

#### ***Add-on functionality***

Optional functionality can be added to the Red Hat Enterprise Linux Server Subscription that has been included. The Add-On inherits the support of the underlying Standard Red Hat Support subscription.

Add-Ons to Red Hat Enterprise Linux enable you to tailor your application environment with workload extensions to suit your particular computing requirements.

#### ***Add-on options for high availability***

- High Availability Add-On

The Red Hat High Availability Add-On provides on-demand failover to make applications highly available. The High Availability Add-On may be configured for

most applications that use customizable agents, as well as for virtual guests. The High Availability Add-On includes failover support for off-the-shelf applications like Apache, MySQL, and PostgreSQL.

- Resilient Storage Add-On

The Red Hat Resilient Storage Add-On enables a shared storage or clustered file system to access the same storage device over a network. By providing consistent storage across a cluster of servers, the Red Hat Resilient Storage Add-On creates a pool of data that is available to each server in the group, and is also protected if any one server fails.

**Note:** The Resilient Storage Add-On includes the High Availability Add-On that may be used to protect applications and storage.

- Load Balancer Add-On

The Red Hat Load Balancer Add-On provides redundancy for web serving, databases, networking, and storage. By creating a virtual address that can be directed to a real server for load balancing or traffic shaping, the Red Hat Load Balancer Add-On allows you to quickly add or remove servers or change balancing algorithms using a browser-based graphical user interface (GUI).

#### *Add-on options for scalability*

- Scalable File System Add-On

The Red Hat Scalable File System Add-On provides support for file systems that are more than 16 terabytes in size. You can manage these large data stores using advanced features such as 64-bit journaling and advanced locking algorithms.

- High Performance Network Add-On

The Red Hat High Performance Network Add-On delivers remote directory memory access over converged Ethernet (RoCE) for those times when low network latency and high capacity are important. Because RoCE bypasses system and kernel calls to place data directly into remote system memory with less CPU overhead, the High Performance Networking Add-On is ideal for high-speed data processing applications that require low latency, for speeding up cluster locking, or for scaling up applications on distributed systems without investing in specialized networking technologies.

#### *Add-on options for Red Hat Management*

- Smart Management Add-On

The Smart Management Add-On includes Red Hat Network Management, and Red Hat Network Provisioning modules for use with Red Hat Network and Red Hat Network Satellite. It enables organizations to easily manage and update Red Hat Enterprise Linux systems using Red Hat Network or Red Hat Network Satellite.

#### *Add-on option for life-cycle management*

- Extended Update Support Add-On

The standard seven-year life cycle for Red Hat Enterprise Linux ensures application binary interface (ABI) and application programming interface (API) stability throughout the support period with regular delivery of technology updates and security packages. However, for those organizations that wish to stay on a particular snapshot for an extended period of time, Red Hat offers the Extended Update Support Add-On, which extends the support period of an update for 18 months and delivers overlapping release support to give enterprise clients more flexibility.

## **Red Hat software**

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The x3950 X5 Model 7143-F2x comes standard with a registration card to download the Red Hat Enterprise Linux software version of choice. This software includes the KVM virtualization hypervisor.

- Red Hat Enterprise Linux (RHEL) Server 4 Sockets Unlimited Guests Standard Red Hat Support 3 Years (4815WNU)

Optional software can be ordered with this model:

- RHEL High-Availability 4 Sockets RH Support 3Yr (4815YAU)
- RHEL Resilient Storage 4 Sockets RH Support 3Yr (4815YMU)
- RHEL Scalable File System 4 sockets RH Support 3Yr (4815VYU)
- RHEL Load Balancer 4 Sockets RH Support 3Yr (4815YYU)
- RHEL High Perf Network 4 Sockets RH Support 3Yr (4815ZAU)
- RHEL Smart Management Unlimited Guests RH Support 3Yr (4815ZNU)
- RHEL Extended Update Support 4 Sockets RH Support 3Yr (4815ZYU)
- RHEV Server 1 Socket Std RH Support 3Yr (Need quantity of 4) (4815VNU x 4)

In addition, one of these media part numbers can be ordered with this model:

- Red Hat Enterprise Linux 5 Media (4815MYU)
- Red Hat Enterprise Linux 6 Media (4815M6U)

## **Model configurations**

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### **IBM System x3850 X5 model configurations**

| System Number | SEO         | Processor    | Cache                     | Memory                 | HDD Iface | HDD                             | Power Supply |
|---------------|-------------|--------------|---------------------------|------------------------|-----------|---------------------------------|--------------|
| 7143-C3U      | 2 x 2.4 GHz | Xeon E7-8870 | 30 MB with 2 memory cards | 4x4 GB<br>10 core 130w | SAS       | open bay<br>with 2 memory cards | 2            |

### **IBM System x3950 X5: Workload Optimized System for Virtualization**

|          |              |       |                         |  |  |     |
|----------|--------------|-------|-------------------------|--|--|-----|
| 7143-F2U | 4 x 2.26 GHz | 24 MB | 96x4 GB<br>10 core 130w | SAS<br>with 8 memory cards and MAX5 V2 | open bay<br>64x4 GB on memory cards and 32x4 GB on MAX5 V2 | 2+2 |
|----------|--------------|-------|-------------------------|--|--|-----|

## **Product positioning**

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These new IBM System x3850 X5 and x3950 X5 models enhance the server line by providing additional choices in preconfigured models. The IBM System x3850 X5 and x3950 X5 servers with optional MAX5 have the unique capability of expanding memory beyond the limit of the processor, increasing the utilization and productivity of the system.

Equipping the IBM System x3850 X5 and x3950 X5 servers with MAX5 increases memory capacity by 50%, making them ideal for virtualized environments and handling complex, memory-intensive on-demand applications that must be supported by space-saving, rack-optimized servers.

The IBM System x3850 X5 and x3950 X5 servers provide excellent scalable processing capability supporting high-speed memory, PCIe bus architecture, and 6-core, 8-core, and 10-core Intel Xeon processors.

This makes the IBM System x3850 X5 and x3950 X5 servers an excellent fit for current and future enterprise on-demand applications.

These high-density, Intel Xeon-based servers are designed to handle complex applications requiring high-speed computing power, advanced high-availability functions, and a minimum amount of rack space.

Applications include:

- On-demand business
- Business intelligence
- Transaction processing
- Enterprise resource planning
- Collaboration applications (Microsoft Exchange and Lotus Notes®)
- Server consolidation and virtualization
- Internet or intranet front-end serving
- Web content serving
- Database storage as a SAN solution
- In-memory databases

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## Reference information

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For information on ServicePacs, refer to Services Announcement [606-013](#), dated August 07, 2006, and Hardware Announcement [106-670](#), dated September 19, 2006.

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### Business Partner information

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If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld® ID and password are required (use IBM ID).

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=111-213>

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## Product number

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The following are features already announced for the 7143 machine type.

| Description                         | MT   | Model | Feature |
|-------------------------------------|------|-------|---------|
| x3850 / x3950 / MAX5 code           | 7143 | AC1   | 6432    |
|                                     |      | MC1   |         |
| eX5 MAX5 labels                     | 7143 | AC1   | 7484    |
|                                     |      | MC1   |         |
| IBM MAX5 for System x Documentation | 7143 | AC1   | 8641    |
|                                     |      | MC1   |         |
| IBM MAX5 for System x               | 7143 | AC1   | 4199    |
|                                     |      | MC1   |         |
| IBM 675W HE Redundant Power Supply  | 7143 | AC1   | 4782    |
|                                     |      | MC1   |         |

### The Single Entity Offerings (SEO)

| Description         | SEO<br>Number |
|---------------------|---------------|
| IBM System x3850 X5 | 7143C3U       |

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## Publications

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The following publications are available immediately; they will be available on the support website and on the Documentation CD.

The *IBM System Types 7145, 7146, 7143, and 7191 x3850 X5 and x3950 X5 Installation and User's Guide*, and the *IBM System Types 7145, 7146, 7143, and 7191 x3850 X5 and x3950 X5 Problem Determination and Service Guide*, in US English versions, are available from our website

<http://www.ibm.com/systems/support>

They contain an introduction to the computer, installation and setup, installing options, reference information, and problem determination. The installation guide has easy-to-use text and illustrations to enable you to quickly set up your x3850 X5 and x3950 X5 servers.

IBM Systems Director systems-management software is included.

**Note:** Software versions, features, and functions shipped with these systems may change as new releases become available or may be discontinued at any time.

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## IBM Publications Center Portal

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<http://www.ibm.com/shop/publications/order>

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided, as well as payment options via credit card. A large number of publications are available online in various file formats, which can currently be downloaded free of charge.

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## Services

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### Global Technology Services

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IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an on-demand business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or visit

<http://www.ibm.com/services/>

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

<http://www.ibm.com/services/continuity>

For details on education offerings related to specific products, visit

<http://www.ibm.com/services/learning/index.html>

Select your country, and then select the product as the category.

## **System x and BladeCenter support services**

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### ***Recommended core technical support***

When you buy IBM System x technology, include the support services you need -- to help keep both your hardware and software working for you, day after day, at peak performance. It's your first step toward helping to protect your investment and sustain high levels of system availability. We offer service-level and response-time options to fit your business needs. And we'll help you get started with a core support package that includes:

- Continuous system monitoring**

Electronic monitoring that helps speed up problem-solving with automated, early detection of potential problems and system errors.

- Hardware maintenance**

World-class remote and on-site hardware problem determination and repair services.

- Software technical support**

Access to help line calls for fast, accurate answers to your questions during installation and throughout ongoing operations.

For more information, visit

<http://www.ibm.com/servers/eserver/xseries/services.html>

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## **Technical information**

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### **Specified operating environment**

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#### ***Physical specifications***

#### **IBM System x3850 X5**

EMEA X=G

7143C3x

|                           |                          |
|---------------------------|--------------------------|
| Processor                 | Xeon E7-8870             |
| Ten-core                  | 130w                     |
| Internal speed            | 2.40 GHz                 |
| Memory bus speed          | 1066 MHz                 |
| Number standard           | 2                        |
| Maximum                   | 4                        |
| Interconnect speed        | 6.40 GT/s                |
| L3 cache total            | 30 MB                    |
| 4 Memory (PC3-10600 DDR3) | 16 GB ECC                |
| DIMMS                     | 4 x 4 GB                 |
| DIMM sockets standard     | 64                       |
| DIMM sockets maximum      | 64                       |
| Capacity                  | 2 TB <sup>5</sup>        |
| Memory expansion card     |                          |
| Number standard           | 2                        |
| Maximum                   | 8                        |
| MAX5                      | Optional                 |
| DIMMS                     | 0                        |
| DIMM sockets maximum      | 32                       |
| Video                     | SVGA                     |
| Memory                    | 16 MB                    |
| SAS                       | ServeRAID-M1015 standard |
| Ports                     | 8                        |
| Connector internal        | 2                        |
| Connector external        | 0                        |

|                          |                                |
|--------------------------|--------------------------------|
| HDD standard             | 0                              |
| Bays available           | 4 Standard, 8 with upgrade kit |
| 2.5-inch slim            | 4 Standard, 8 with upgrade kit |
| Hot-swap                 | 4 Standard, 8 with upgrade kit |
| Internal capacity        | 4 TB <sup>6</sup>              |
| 320 GB Fusion IO         | 7                              |
| PCIe sockets             | 7                              |
| Management processor IMM | Standard                       |
| RAID 0/1                 | Standard                       |
| ServeRAID M5015 6Gb      | Optional                       |
| Dual Ethernet            | Standard                       |
| 10/100/1000 Mbps         |                                |
| Emulex 10Gb Dual-port    | Standard                       |
| Ethernet Adapter         |                                |
| Optical disk drive       | Optional                       |
| Power supply             | 1975 W                         |
| Number standard          | 2                              |
| Maximum                  | 2                              |
| Hot-swap                 | Yes                            |
| Redundant power          | Standard                       |
| Auto-restart             | Yes                            |
| MAX5 power supply        | 675 W                          |
| MAX5 number standard     | 0                              |
| MAX5 maximum             | 2                              |
| Hot-swap                 | Yes                            |
| Redundant power          | Standard                       |
| Auto-restart             | Yes                            |

## x3950 X5 Workload Optimized System for Virtualization

EMEA X=G

7143F2x

|                          |                                |
|--------------------------|--------------------------------|
| Processor                | Xeon E7-4860                   |
| Ten-core                 | 130w                           |
| Internal speed           | 2.26 GHz                       |
| Memory bus speed         | 1066 MHz                       |
| Number standard          | 4                              |
| Maximum                  | 4                              |
| Interconnect speed       | 6.40 GT/s                      |
| L3 cache total           | 24 MB                          |
| Memory (PC3-10600 DDR3)  | 256 GB ECC                     |
| DIMMS                    | 64 x 4 GB                      |
| DIMM sockets standard    | 64                             |
| DIMM sockets maximum     | 64                             |
| Capacity                 | 2 TB <sup>5</sup>              |
| Memory expansion card    |                                |
| Number standard          | 8                              |
| Maximum                  | 8                              |
| MAX5 V2                  | Standard                       |
| Memory (PC3-10600 DDR3)  | 128 GB ECC                     |
| DIMMS                    | 32 x 4 GB                      |
| DIMM sockets maximum     | 32                             |
| Video                    | SVGA                           |
| Memory                   | 16 MB                          |
| SAS controller           | ServeRAID-M1015 standard       |
| Ports                    | 8                              |
| Connector internal       | 2                              |
| Connector external       | 0                              |
| HDD standard             | 0                              |
| Bays available           | 4 Standard, 8 with upgrade kit |
| 2.5-inch slim            | 4 Standard, 8 with upgrade kit |
| Hot-swap                 | 4 Standard, 8 with upgrade kit |
| Internal capacity        | 4 TB <sup>6</sup>              |
| PCIe sockets             | 7                              |
| Management processor IMM | Standard                       |
| RAID 0/1                 | Standard                       |
| ServeRAID M5015 6Gb      | Optional                       |
| Dual Ethernet            | Standard                       |
| 10/100/1000 Mbps         |                                |
| Emulex 10Gb Dual-port    | Standard                       |

|   |          |
|---|----------|
| Ethernet Adapter                                    |          |
| Optical disk drive                                  | Optional |
| Red Hat Enterprise Linux software Registration Card | Standard |
| Power supply  | 1975 W   |
| Number standard                                     | 2        |
| Maximum   | 2        |
| Hot-swap  | Yes      |
| Redundant power                                     | Standard |
| Auto-restart  | Yes      |
| MAX5 power supply                                   | 675 W    |
| MAX5 number standard                                | 2        |
| MAX5 maximum  | 2        |
| Hot-swap  | Yes      |

<sup>5</sup> Capacities are based on installation of the eight memory expansion cards and eight 32 GB DIMMs installed in each card.

<sup>6</sup> Capacities are based on installation of eight 500 GB 2.5-inch SFF SATA HDDs. For the latest information on supported HDD options, visit

<http://www-03.ibm.com/servers/eserver/serverproven/compat/us/indexsp.html>

Supported video mode capabilities for the SVGA PCI controller:

Windows 2003 (32- and 64-bit) and Linux (all distributions)

| Resolution       | Colors | Refresh Rate (Hz)                                    |
|------------------|--------|--|
| 640 x 480 x 8    | 256    | 60, 72, 75, 85, 90, 100, 120, 160, 200               |
| 640 x 480 x 16   | 64K    | 60, 72, 75, 85, 90, 100, 120, 160, 200               |
| 640 x 480 x 32   | 16M    | 60, 72, 75, 85, 90, 100, 120, 160, 200               |
| 800 x 600 x 8    | 256    | 60, 70, 72, 75, 85, 90, 100, 120, 160, 200           |
| 800 x 600 x 16   | 64K    | 60, 70, 72, 75, 85, 90, 100, 120, 160, 200           |
| 800 x 600 x 32   | 16M    | 60, 70, 72, 75, 85, 90, 100, 120, 160                |
| 1024 x 768 x 8   | 256    | 60, 70, 72, 75, 85, 90, 100, 120, 140, 150, 160, 200 |
| 1024 x 768 x 16  | 64K    | 60, 70, 72, 75, 85, 90, 100, 120, 140, 150, 160, 200 |
| 1024 x 768 x 32  | 16M    | 60, 70, 72, 75, 85, 90, 100                          |
| 1280 x 1024 x 8  | 256    | 60, 72, 75   |
| 1280 x 1024 x 16 | 64K    | 60, 72, 75   |
| 1280 x 1024 x 32 | 16M    | 60, 72, 75   |

### ***Dimensions***

4U rack drawer

- Width: 440 mm (17.32 in.)
- Depth: 712.1 mm (28.04 in.)
- Height: 172.8 mm (6.81 in.)
- Minimum configuration: 35.4 kg (78 lb)
- Maximum configuration: 49.90 kg (110 lb)

### ***Electrical***

- 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; System 20A (10A/PS)
- 200 to 208 (nominal) V ac; 50 Hz or 60 Hz; System 10A
- 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; System 9A
  - Minimum configuration: 0.20 kVA (one power supply)
  - Minimum configuration: 0.26 kVA (two power supplies)
  - Typical configuration: 1.12 kVA (two power supplies)
  - Maximum configuration: 2.16 kVA (two power supplies)

- Btu output:
  - Ship configuration (1PS): 648 Btu/hr (190 watts)
  - Ship configuration (2PS): 802 Btu/hr (235 watts)
  - Typical configuration: 3,753 Btu/hr (1100 watts)
  - Full configuration: 7,336 Btu/hr (2150 watts)
- Noise level horizontal position: 6.3 bels

**Note:** The noise emission level stated is the declared (upper limit) sound power level, in bels, for a random sample of machines. All measurements made in accordance with ISO 7779 and reported in conformance with ISO 9296.

### X3850 X5 configuration idling with Windows 2008 (at 25°C)

#### **Standards**

x3850 X5 and x3950 X5 servers are intended for use as rack-drawer servers and are tested and designed to operate in a horizontal position.

These systems support or comply with the following standards:

- Multiprocessor Specification (MPS) 1.4
- Hardware-enabled to meet ISO 9241, Part 3

In addition to the above standards, they are compatible with the PCIe specification.

#### **Equipment approvals and safety**

- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 4, Class A
- IEC/UL 60950-1, 2nd Edition
- CAN/CSA - C22.2 No. 60950-1-07 2nd Edition
- NOM-019<sup>7</sup>

<sup>7</sup> These servers are certified by the respective UL and NOM agencies.

#### **Operating environment**

- Temperature:
  - 10.0°C to 35.0°C (50°F to 95°F) at 0 to 914 m (0 to 3,000 ft)
  - 10.0°C to 32.0°C (50°F to 90°F) at 914 to 2,133 m (3,000 to 7,000 ft)
- Relative humidity: 8% to 80%

#### **Hardware requirements**

For attended installation of an operating system, this server requires a compatible:

- Keyboard
- Mouse
- Display

Unattended or remote installation may be performed without requiring some or all of these components. Review your unattended software installation program information for specific hardware configuration requirements.

For service, the servers require a compatible:

- Keyboard
- Mouse
- Display

When having the unit serviced, plan to have these components attached to your server either directly or indirectly via a console switch.

### **Software requirements**

#### **Programming requirements**

The following network operating systems have been tested for compatibility with the x3850 X5 and x3950 X5 server.

#### **Network operating systems**

- Microsoft
  - Windows Server 2008 R2 (64-bit)
  - Windows Server 2008 (64-bit)
- Linux
  - Red Hat EL 5 Server for 64-bit
  - Red Hat EL 5 Server for 64-bit (with Xen)
  - Red Hat EL 6 Server for 64-bit
  - SUSE Linux ES 10 for x86-64
  - SUSE Linux ES 10 for x86-64 (with Xen)
  - SUSE Linux ES 11 for x86-64
  - SUSE Linux ES 11 for x86-64 (with Xen)

The MAX5 drawer is designed to work seamlessly with the servers and operating system software, and provides a high-speed low-latency path to additional memory. The connection, enabled by the IBM-exclusive eX5 technology, is fast and wide enough to ensure that operating systems and applications see just a single, large memory space - thus no software modifications are necessary to use MAX5.

**Note:** For information on additional support, certification, and versions of network operating systems, visit

<http://www.ibm.com/servers/eserver/serverproven/compat/us/>

IBM makes no representation or warranty regarding third-party products, including those designated as ServerProven.

#### **Compatibility**

The IBM System x3850 X5 and x3950 X5 servers contain licensed system programs that include set configuration, set features, and test programs. IBM system BIOS is loaded from a "flash" EEPROM into system memory. This BIOS provides instructions and interfaces designed to support the standard features of the IBM System x3850 X5 and x3950 X5 servers and to maintain compatibility with many current software programs.

For detailed information about IBM and non-IBM devices, adapters, software, and network operating systems supported with IBM System x3850 X5 and x3950 X5 servers, visit

<http://www-03.ibm.com/servers/eserver/serverproven/compat/us/indexsp.html>

Contact your IBM representative or IBM Business Partner, or refer to the IBM Sales Manual for information on the compatibility of hardware and software for IBM System x3850 X5 and x3950 X5 servers. The *Sales Manual* is updated periodically as new features and options are announced that support these servers.

## **Limitations**

### **Memory**

The x3850 X5 and x3950 X5 servers are shipped with up to 384 GB high-speed PC3-10600 DDR3 ECC memory standard, supporting up to 3 TB (with 32 GB DIMM) of system memory per server + MAX5 5U combination. All supported system memory is addressable through direct memory access (DMA). This server supports 2 GB, 4 GB, 8 GB, 16 GB, and 32 GB 1.5 V, or 1.35 V, 240-pin, PC3-10600 ECC DDR3 SDRAM RDIMMs. Supported DIMMs can coexist in the same server; however, memory DIMMs of the same capacity must be installed in matched pairs. Refer to the [Planning information](#) section or the IBM System x3850 X5 and x3950 X5 server web page for memory options.

The x3850 X5 and x3950 X5 servers have RAID 0 and 1 standard. The ServeRAID M5015 SAS/SATA Controller provides additional RAID levels.

### *ServerGuide*

Use the version of *ServerGuide* available on the web to load software and drivers. Earlier versions of *ServerGuide* may not be compatible with the servers.

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## **Planning information**

### ***Customer responsibilities***

#### ***x3850 X5 and x3950 X5 Server and Related Options***

The x3850 X5 and x3950 X5 servers and the IBM MAX5 for System x are designated as customer setup. Customer setup instructions are shipped with systems.

### **Configuration information**

#### ***Bay configuration***

The x3850 X5 and x3950 X5 servers contain eight customer-accessible drive bays on the front of the server. A lower left bay is for the slim combo drive. Eight unpopulated 2.5-inch, slim-high, hot-swap drive bays are located beneath this bay.

The UltraSlim Enhanced SATA CD-RW / DVD-ROM Combo drive is cabled directly to the SATA port.

#### ***Internal SCSI cabling***

Models of the x3850 X5 and x3950 X5 servers contain a DASD backplane supporting four hot-swap, SCA-2-compliant drive bays. The x3850 X5 and x3950 X5 models with the ServeRAID M1015 controller support RAID 0 and 1 standard. The optional ServeRAID-5015 SAS/SATA Controller provides additional RAID levels.

#### ***Processor upgrade***

The following processor upgrade options are supported:

- Intel Xeon Processor E7-4807 - 1.86 GHz 18 MB L3 Cache 1066 MHz six-core Processor Upgrade (88Y5320)
- Intel Xeon Processor E7-4820 - 1.86 GHz 18 MB L3 Cache 1066 MHz eight-core Processor Upgrade (88Y5322)
- Intel Xeon Processor E7-4830 - 2.13 GHz 24 MB L3 Cache 1066 MHz eight-core Processor Upgrade (88Y5324)
- Intel Xeon Processor E7-4850 - 2.0 GHz 24 MB L3 Cache 1066 MHz ten-core Processor Upgrade (88Y5396)
- Intel Xeon Processor E7-4860 - 1.86 GHz 24 MB L3 Cache 1066 MHz ten-core Processor Upgrade (88Y5326)
- Intel Xeon Processor E7-4870 - 1.86 GHz 30 MB L3 Cache 1066 MHz ten-core Processor Upgrade (69Y1852)

- Intel Xeon Processor E7-8830 - 2.13 GHz 24 MB L3 Cache 1066 MHz eight-core Processor Upgrade (69Y1858)
- Intel Xeon Processor E7-8850 - 2.0 GHz 24 MB L3 Cache 1066 MHz ten-core Processor Upgrade (88Y5398)
- Intel Xeon Processor E7-8860 - 2.26 GHz 24 MB L3 Cache 1066 MHz ten-core Processor Upgrade (69Y1862)
- Intel Xeon Processor E7-8870 - 2.4 GHz 30 MB L3 Cache 1066 MHz stencore Processor Upgrade (69Y1864)

### ***Memory support***

The following memory options are supported:

- 2 GB PC3-10600 CL4 ECC DDR3 SDRAM RDIMM (44T1481)
- 4 GB PC3-8500 CL4 ECC DDR3 SDRAM RDIMM (46C7448)
- 8 GB PC3-8500 CL4 ECC DDR3 SDRAM RDIMM (46C7482)
- 16 GB PC3-8500 CL4 ECC DDR3 SDRAM RDIMM (46C7483)
- 32 GB (1x32GB, 4Rx4, 1.35V) PC3L-8500 CL7 ECC DDR3 1066MHz LP RDIMM (90Y3206)
- 4 GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM (49Y1407)
- 8 GB (1x8GB, 4Rx8, 1.35V) PC3L-8500 CL7 ECC DDR3 1066MHz LP RDIMM (49Y1399)
- 16 GB (1x16GB, 4Rx4, 1.35V) PC3L-8500 CL7 ECC DDR3 1066MHz LP RDIMM (49Y1400)

Memory DIMMs should be plugged in order of size -- largest first, followed by the next size. When plug order moves to new DIMM numbers, start with the memory card with the smallest total amount.

- Example: Four CPUs, four memory cards, four 8 GB DIMMs, eight 4 GB DIMMs.
  - Card1 DIMMs 1 and 8 = 2 x 8 GB
  - Card7 DIMMs 1 and 8 = 2 x 8 GB
  - Card3 DIMMs 1 and 8 = 2 x 4 GB
  - Card5 DIMMs 1 and 8 = 2 x 4 GB
- When moving to next DIMM locations 3 and 6, start with the card with the least amount of memory.
  - Card3 DIMMs 3 and 6 = 2 x 4 GB
  - Card5 DIMMs 3 and 6 = 2 x 4 GB
- End result is four memory cards, each with 16 GB, balanced for the best performance

**Note:** Refer to details on the ServerProven Plan for memory supported in x3950 and memory supported in MAX5 at

<http://www-03.ibm.com/servers/eserver/serverproven/compat/us/indexsp.html>

### ***PCIe adapter installations***

The x3850 X5 and x3950 X5 servers contain PCIe architecture and seven 5.0 Gb PCIe I/O (one x16, five x8, one x4) sockets.

### ***Rack installations***

x3850 X5 and x3950 X5 4U, rack-drawer models are designed to be installed in a 19-inch rack cabinet designed for 26-inch deep devices, such as the NetBAY42 ER, NetBAY42 SR, NetBAY25 SR, or NetBAY11.

If using a non-IBM rack, the cabinet must meet the EIA-310-D standards with a depth of at least 71.1 cm (28 in). Also, adequate space (approximately 5 cm (2 in)

for the front bezel and 2.5 cm (1 in) for air flow) must be maintained from the slide assembly to the front door of the rack cabinet to allow sufficient space for the door to close and provide adequate air flow.

### **Power considerations**

These x3850 X5 and x3950 X5 models include two 1975-watt, voltage sensing, rear access, hot-swap power supplies in the main x3850 or x3950 X5 chassis, with two additional 675-watt, voltage sensing, rear access, hot-swap power supplies in the MAX5 expansion option.

### **Cable orders**

The 10/100/1000 Mbps full-duplex, Dual Ethernet PCIe controller is standard with the x3850 X5 and x3950 X5 servers. The RJ-45 connectors provide a 10BASE-T or 100/1000BASE-TX interface for connecting twisted-pair cable to the Ethernet network. Cabling is not included with the server. To connect the Ethernet controller to a repeater or switch, use a UTP cable with RJ-45 connectors at both ends. For 100/1000 Mbps operation, Category 5 cabling must be used. For 10 Mbps operation, Category 3, or better, cabling must be used.

There are no additional cabling requirements, other than for system power, keyboard, mouse, and monitor connections.

### **Installability**

The x3850 X5 and x3950 X5 server requires about 40 minutes for installation. Installation includes unpacking, setting up, and powering on the system. Additional time is required to install an operating system, additional adapters, or features.

### **Packaging**

| Product                         | Shipment group   | Number of boxes |
|---------------------------------|--|-----------------|
| IBM System x3850 X5 and 3950 X5 | System unit carton<br>Contents:<br><br>System unit<br>IBM MAX5 for System x (if ordered)<br>Rack kits (two sets):<br>Rails<br>Cable management hardware  | 1               |
| IBM System x3850 X5 and 3950 X5 | Country kit carton<br>Contents:<br><br>Four 2.8m 220 V intra-rack cables<br>Safety booklet<br>CD-ROM Packages<br>IBM Systems Director<br>CD-ROM Packages<br>Active Energy Manager<br>On/off switch cover | 1               |

The x3850 X5 and x3950 X5 systems are shipped as a single package. The country kit carton is contained inside the top portion of the system unit carton, while the rack components are contained in the system unit carton.

The following publications will be available on the support website and on the Documentation CD.

The *IBM System Types 7145, 7146, 7143, and 7191 x3850 X5 and x3950 X5 Installation and User's Guide*, and the *IBM System Types 7145, 7146, 7143, and 7191 x3850 X5 and x3950 X5 Problem Determination and Service Guide*, in US English versions, are available from our website.

The *Warranty Information* publication will be available as a hardcopy publication at

<http://www.ibm.com/systems/support>

## **Related options**

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### **Processor upgrades**

- Xeon processor
- Installation publications/warranty

### ***Supplies***

None

## **Security, auditability, and control**

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Security and auditability features include:

- Power-on and privileged access password functions provide controls of who has access to the data and server setup program on the server.
- A set unattended boot mode allows the system keyboard to be locked to all entries except the password and at the same time allows other computers on the network to access the system disk drive.
- A selectable boot sequence can be used to prevent unauthorized installation of software or removal of data from the diskette drive.
- These servers are Winbond Trusted Platform Module V1.2, Trusted Computing Group (TCG) compliant.

### ***Limitations***

The x3850 X5 and x3950 X5 servers have no security intrusion detection; therefore, they should be installed in a rack environment that provides security through lockable doors or other security measures. Client's responsibility to ensure that the server is secure to protect sensitive data.

The system supports integrity measurements. The TPM is TCG V1.2-compliant, and is ready for use with software purchased from third-party TPM Ecosystem partners in compliance with the TPM V1.2 specification.

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

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## **Terms and conditions**

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### ***IBM Global Financing***

Yes

### **IBM System x3850 X5 and x3950 X5**

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To obtain copies of the IBM Statement of Limited Warranty, contact your reseller or IBM.

In the United States, call 800-IBM-SERV (426-7378), or write to:

Warranty Information  
P.O. Box 12195  
Research Triangle Park, NC 27709  
Attn: Dept JDJA/B203

## **Warranty period**

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- Three years
- Optional features - One year

An IBM part or feature installed during the initial installation of an IBM machine is subject to a full warranty effective on the date of installation of the machine. An IBM part or feature which replaces a previously installed part or feature assumes the remainder of the warranty period for the replaced part or feature. An IBM part or feature added to a machine without replacing a previously installed part or feature is subject to a full warranty effective on its date of installation. Unless specified otherwise, the warranty period, type of warranty service, and service level of a part or feature is the same as the machine it is installed.

The following have been designated as consumables or supply items and are, therefore, not covered by this warranty:

- ServeRAID SAS controller battery
- Raid Battery

## **Warranty service**

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If required, IBM provides repair or exchange service, depending on the type of warranty service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines On-site Service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. Service levels are response-time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country- and location-specific information.

The type of service is Customer Replaceable Unit (for example, keyboard, mouse, speaker, memory, or hard disk drive) Service and On-site Service.

### ***Customer Replaceable Unit (CRU) Service***

IBM provides a replacement CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM at any time on your request. A CRU is designated as being either a Tier 1 (mandatory) or a Tier 2 (optional) CRU. Installation of Tier 1 CRUs, as specified in this announcement, is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation. You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service designated for your Machine.

Based upon availability, a CRU will be shipped for next-business-day (NBD) delivery. IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM. When return is required, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

The following parts have been designated as Tier 1 CRUs:

- Battery 3.0 Volt CMOS
- Op panel card
- 1975W PS
- PDU power cord

- 60 mm fan
- 120 mm fan
- Top cover
- Top bracket asm
- Sys bezel
- Rail kit
- Shipping bracket
- Cable management arm
- Filler kit
- Label kit
- SAS data cable
- Memory DIMMs
- Hard disk drives
- Ethernet adapter
- RAID card
- MAX5 fans
- MAX5 675W PS

#### ***On-site Service***

At IBM's discretion you will receive CRU service or IBM or your reseller will repair the failing machine at your location and verify its operation. If required, On-site Repair is provided, 9 hours per day, Monday through Friday excluding holidays, NBD response. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well lit, and suitable for the purpose. On-site Service is not available in all countries, and some countries have kilometer or mileage limitations from an IBM service center. In those locations where On-site Service is not available, the normal in-country service delivery is used.

Call IBM at 1-800-IBM-SERV (426-7378) to assist with problem isolation for hardware to determine if warranty service is required. Telephone support may be subject to additional charges, even during the limited warranty period.

Calls must be received by 5:00 p.m. local time in order to qualify for NBD service.

#### ***International Warranty Service (IWS)***

IWS is available in selected countries or regions.

The warranty service type and the service level provided in the servicing country may be different from that provided in the country in which the machine was purchased.

Under IWS, warranty service will be provided with the prevailing warranty service type and service level available for the IWS-eligible machine type in the servicing country, and the warranty period observed will be that of the country in which the machine was purchased.

To determine the eligibility of your machine and to view a list of countries where service is available, visit

<http://www-947.ibm.com/support/entry/portal/docdisplay?Indocid=GCOR-3FBJK2>

For more information on IWS, refer to Services Announcement [601-034](#), dated September 25, 2001.

## **Licensing**

Programs included with this product are licensed under the terms and conditions of the License Agreements that are shipped with the system.

## **Maintenance services**

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### ***ServicePac , ServiceSuite , ServiceElect, and ServiceElite***

ServicePac®, ServiceSuite®, ServiceElect, and ServiceElite provide hardware warranty service upgrades, maintenance, and selected support services in one agreement.

### ***Warranty service upgrade***

During the warranty period, a warranty service upgrade provides an enhanced level of On-site Service for an additional charge. A warranty service upgrade must be purchased during the warranty period and is for a fixed term (duration). It is not refundable or transferable and may not be prorated. If required, IBM will provide the warranty service upgrade enhanced level of On-site Service acquired by the customer. Service levels are response-time objectives and are not guaranteed.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines On-site Service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts.

CRUs will be provided as part of the machine's standard warranty CRU Service except that you may install a Tier 1 CRU yourself or request IBM installation, at no additional charge, under one of the On-site Service levels specified below.

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well lit, and suitable for the purpose.

### ***Maintenance service***

If required, IBM provides repair or exchange service, depending on the type of maintenance service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines On-site Service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. Service levels are response-time objectives and are not guaranteed.

### ***CRU Service***

If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or hard disk drive), IBM will ship the CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM at any time on your request.

IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM. When return is required, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

### **On-site Service**

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well lit, and suitable for the purpose.

### **Maintenance service (ICA)**

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Maintenance services are available for ICA legacy contracts.

#### **Alternative service (warranty service upgrades)**

During the warranty period, a warranty service upgrade provides an enhanced level of On-site Service for an additional charge. A warranty service upgrade must be purchased during the warranty period and is for a fixed term (duration). It is not refundable or transferable and may not be prorated. If required, IBM will provide the warranty service upgrade enhanced level of On-site Service acquired by the customer. Service levels are response-time objectives and are not guaranteed.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines On-site Service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts.

A CRU will be provided as part of the machine's standard warranty CRU Service except that you may install a Tier 1 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service designated for your machine.

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well lit, and suitable for the purpose.

### **Maintenance service**

If required, IBM provides repair or exchange service, depending on the type of maintenance service specified below for the machine. IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines On-site Service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. Service levels are response-time objectives and are not guaranteed.

### **CRU Service**

If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or hard disk drive), IBM will ship the CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM at any time on your request.

IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM. When return is required, return instructions and a container are shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

### **On-site Service**

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well lit, and suitable for the purpose.

### **Non-IBM parts support**

#### **Warranty service**

IBM is now shipping machines with selected non-IBM parts that contain an IBM field replaceable unit (FRU) part number label. These parts are to be serviced during the IBM machine warranty period. IBM is covering the service on these selected non-IBM parts as an accommodation to its customers, and normal warranty service procedures for the IBM machine apply.

#### **Warranty service upgrades and maintenance services**

Under certain conditions, IBM Integrated Technology Services repairs selected non-IBM parts at no additional charge for machines that are covered under warranty service upgrades or maintenance services.

IBM Service provides hardware problem determination on non-IBM parts (for example, adapter cards, PCMCIA cards, disk drives, or memory) installed within IBM machines covered under warranty service upgrades or maintenance services and provides the labor to replace the failing parts at no additional charge.

If IBM has a Technical Service Agreement with the manufacturer of the failing part, or if the failing part is an accommodations part (a part with an IBM FRU label), IBM may also source and replace the failing part at no additional charge. For all other non-IBM parts, customers are responsible for sourcing the parts. Installation labor is provided at no additional charge, if the machine is covered under a warranty service upgrade or a maintenance service.

#### **IBM hourly service rate classification**

One

#### **Field-installable features**

Yes

#### **Model conversions**

No

#### **Machine installation**

Customer setup. Customers are responsible for installation according to the instructions IBM provides with the machine.

#### **Graduated program license charges apply**

No

#### **Licensed machine code**

IBM Machine Code is licensed for use by a customer on the IBM machine for which it was provided by IBM under the terms and conditions of the IBM License Agreement for Machine Code, to enable the machine to function in accordance with its specifications, and only for the capacity authorized by IBM and acquired by the customer. You can obtain the agreement by contacting your IBM representative or visiting

[http://www-304.ibm.com/systems/support/machine\\_warranties/machine\\_code.html](http://www-304.ibm.com/systems/support/machine_warranties/machine_code.html)

IBM may release changes to the Machine Code. IBM plans to make the Machine Code changes available for download from the IBM System x technical support website

<http://www-304.ibm.com/systems/support/>

If the machine does not function as warranted and your problem can be resolved through your application of downloadable Machine Code, you are responsible for downloading and installing these designated Machine Code changes as IBM specifies. If you would prefer, you may request IBM to install downloadable Machine Code changes; however, you may be charged for that service.

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## Prices

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For current prices, contact IBM at 888-Shop-IBM (746-7426) or visit

<http://www-03.ibm.com/systems/x/>

The following are features already announced for the 7143 machine type.

| Description                         | Model Number | Feature Number | Initial/<br>MES/<br>Both/<br>Support |
|-------------------------------------|--------------|----------------|--------------------------------------|
| x3850 / x3950 / MAX5 code           | AC1<br>MC1   | 6432           | Initial<br>Initial                   |
| ex5 MAX5 labels                     | AC1<br>MC1   | 7484           | Initial<br>Initial                   |
| IBM MAX5 for System x Documentation | AC1<br>MC1   | 8641           | Initial<br>Initial                   |
| IBM MAX5 for System x               | AC1<br>MC1   | 4199           | Initial<br>Initial                   |
| IBM 675W HE Redundant Power Supply  | AC1<br>MC1   | 4782           | Initial<br>Initial                   |

| Description  | SEO Numbers | Initial/<br>MES/<br>Both/<br>Support | CSU |
|--|-------------|--------------------------------------|-----|
| x3850 X5 - 2x2.40 GHz/30 MB, 16 GB 7143C3U<br>Xeon E7-8870 10-core 130w  |             | Both                                 | Yes |
| x3950 X5 - 4x2.26 GHz/24 MB, 384 GB 7143F2U<br>Xeon E7-4860 10-core 130w |             | Both                                 | Yes |

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## ServicePac for Warranty and Maintenance

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| Machine Type/Model | Description  | ServicePac Part Number |
|--------------------|--|------------------------|
| 7143-XXX           | 3 YR onsite repair<br>9x5x4 hour average response  | 10N3058                |
| 7143-XXX           | 3 YR onsite repair<br>24x7x4 hour average response | 10N3059                |

|          |   |         |
|----------|---|---------|
| 7143-XXX | 3 YR onsite repair<br>24x7x2 hour average response  | 10N3060 |
| 7143-XXX | 4 YR onsite repair<br>9x5/next day average response | 10N3061 |
| 7143-XXX | 4 YR onsite repair<br>9x5x4 hour average response   | 10N3062 |
| 7143-XXX | 4 YR onsite repair<br>24x7x4 hour average response  | 10N3063 |
| 7143-XXX | 4 YR onsite repair<br>24x7x2 hour average response  | 10N3064 |
| 7143-XXX | 5 YR onsite repair<br>9x5/next day average response | 10N3065 |
| 7143-XXX | 5 YR onsite repair<br>9x5x4 hour average response   | 10N3066 |
| 7143-XXX | 5 YR onsite repair<br>24x7x4 hour average response  | 10N3067 |
| 7143-XXX | 5 YR onsite repair<br>24x7x2 hour average response  | 10N3068 |

| Machine Type/Model | Description   | ServicePac Part Number |
|--------------------|---|------------------------|
| 7143-XXX           | 1-year MA IOR 9 x 5<br>Next Business Day average response | 10N3069                |
| 7143-XXX           | 1-year MA IOR 9 x 5<br>4-hour average response            | 10N3070                |
| 7143-XXX           | 1-year MA IOR 24 x 7<br>4-hour average response           | 10N3071                |
| 7143-XXX           | 1-year MA IOR 24 x 7<br>2-hour average response           | 10N3072                |
| 7143-XXX           | 2-year MA IOR 9 x 5<br>Next Business Day average response | 10N3073                |
| 7143-XXX           | 2-year MA IOR 9 x 5<br>4-hour average response            | 10N3074                |
| 7143-XXX           | 2-year MA IOR 24 x 7<br>4-hour average response           | 10N3075                |
| 7143-XXX           | 2-year MA IOR 24 x 7<br>4-hour average response           | 10N3076                |

These ServicePac offerings are valid for models announced in the United States.

### **IBM System x3850 X5 and x3950 X5 - 7143**

Hardware models announcing with this release will utilize existing US ServicePacs.

Reference the following IBM website for applicable US ServicePac information

[http://www-935.ibm.com/services/us/its/html/servicepac\\_americas.html](http://www-935.ibm.com/services/us/its/html/servicepac_americas.html)

#### ***Maintenance charges***

For additional information on maintenance and pricing, please contact your IBM Sales Representative or your IBM Business Partner, or call 1-800-IBM-CALL (1-800-426-2255).

For ServiceElect (ESA) maintenance service charges, contact IBM Global Services at 888-IBM-4343 (426-4343).

## **IBM Global Financing**

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## **Order now**

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<http://www.ibm.com/planetwide/us/>

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#### **Corrections**

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**(Corrected on October 20, 2011)**

Revisions made to Product number, Description, and Prices sections.